Space Weather Forecast

Issued on Wednesday 19 February 2025 at 12:06 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with occasional Common-class activity, peaking at 19/1049 UTC from a small bipolar region in centre disc.

There are currently seven sunspot regions on the visible disc.

There are two moderately large bipolar spot groups located in the southeast quadrant showing some magnetic complexity. The western-most group has exhibited some reduction of intermediate spots in recent imagery, but remains a wide group with fairly large lead/trailer spots. The other group just to to east, has shown some waxing/waning within its intermediate spots. Remaining regions are either small or magnetically relatively simple at present, and stable or in slight decay.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed. Some instability was observed in the southwest starting around 18/0000 UTC and again following Common-class flaring between 19/1000-1200UTC , but no CME is apparent in available imagery at present.

Solar Wind / Geomagnetic Activity: Solar winds were slightly elevated or elevated, varying between 450-520 km/s. Interplanetary Magnetic Field was mostly weak until the likely arrival of a CME around 18/1930UTC, becoming moderate at times. The north-south component was mostly weakly positive at first, but then extended periods of negative/southward developed between 18/1930-19/0600UTC, peaking at slightly moderate. Geomagnetic activity was mainly Quiet at first (Kp 1 to 2), but then increased to Unsettled to G1/Minor Storm (Kp 3-5) between 18/2100-19/0900 UTC, following the aforementioned CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, with a chance of isolated Moderate class flares.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Wind / Geomagnetic Activity: There are no CMEs currently assessed as Earth directed. However, a glancing CME was observed arriving at L1 at around 18/1930 UTC, with a steady rise in the solar wind speeds, peaking near 520km/s overnight UTC. The CME probably left the Sun during the 14-15 Feb.

Otherwise, the now slightly elevated solar wind speeds are expected to gradually ease towards background as the influence of CH15/- wanes. Geomagnetic activity is expected to be mostly Quiet to Unsettled with a chance of Active intervals at first on Day 1. Any chance of further G1/Minor Storm activity is now slight and reducing.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels. However, there is a slightly increasing risk of proton flux rising in response to any larger flares, as the current sunspot regions move westwards into a better position for proton events to be seen at Earth.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	40	40	40
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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